Magnetic resonance-retrograde pyelography: A novel technique for evaluation of chyluria

Apul Goel, Neeraj Kumar Goyal, Anit Parihar[1], Ragini Singh[1]

Departments of Urology, and [1]Radiology, King George Medical University, Lucknow, Uttar Pradesh, India

ABSTRACT

There are no standardized radiological investigations in a patient with chyluria. Retrograde pyelography (RGP) is usually done to demonstrate pyelo-lymphatic reflux before invasive therapy in the form of sclerotherapy and surgery. We describe magnetic resonance-RGP using gadolinium to demonstrate pyelo-lymphatic reflux in addition to the other intra-abdominal details provided by MRI. The advantages of this technique include avoidance of ionic contrast media and radiation exposure and possibility of better understanding of the disease pathophysiology.

Key words: Chyluria, gadolinium, magnetic resonance imaging

INTRODUCTION

Chyluria is a common condition in tropical and subtropical countries where it is a sequel of lymphatic filariasis. The non-tropical chyluria encountered in western countries is relatively uncommon. Chyluria is diagnosed on the basis of milky white appearance of urine and demonstration of chyle, lymphocytes and triglycerides in microscopic examination. Apart from its etiology, it is important to define the precise anatomic location of a lymphatic fistula, leak or obstruction to guide subsequent intervention.[1] The management of refractory chyluria is invasive therapy in the form of renal pelvic instillation sclerotherapy (RPIS) or surgical disconnection of pyelolymphatic fistulae requiring precise anatomical details. However, it is often difficult to determine the exact site of chyle leakage; lymphangiography or lymphoscintigraphy being the traditional approaches for this purpose. At many centers, routine retrograde pyelography (RGP) is performed to demonstrate pyelolymphatic reflux (PLR) before any invasive therapy. Recently, magnetic resonance imaging (MRI) has been shown to be a useful non-invasive tool that provides detailed anatomical information about the source of chyluria.[2,3] We describe a novel technique of Gadolinium-Magnetic Resonance-RGP (Gd-MR-RGP) to demonstrate PLR, in addition to the intra-abdominal details provided by MRI that avoids ionic contrast and radiation exposure in special situations.

For correspondence: Dr. Apul Goel, Department of Urology, King George Medical University, Lucknow - 226 003, Uttar Pradesh, India. E-mail: goelapul1@rediffmail.com

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CASE REPORT

A 35-year-old woman with refractory chyluria underwent Gd-RGP-MRI using 1.5 T MR Scanner (Signa; GE Healthcare, Milwaukee, USA). Coronal fat suppressed T2 and T1 sequences were taken before instillation of 2.5 ml of gadolinium MR contrast (0.5 mmol MultiHance; Bracco, Milan, Italy) mixed in 5.0 ml of normal saline through the ureteric catheter. Post-gadolinium injection abdominal angiography sequences were acquired and maximum intensity projection (MIP) images were reconstructed [Figure 1].

DISCUSSION

In western countries, where chyluria is almost always non-tropical, cross-sectional imaging constitutes an important part of the evaluation. However in filarial endemic countries, where chyluria is regarded as infectious in origin until proved otherwise, routine radiological imaging is not always indicated. However, the demonstration of PLR by RGP has many advantages including the demonstration of lymphatic fistulae, prognostication regarding the response to treatment, and estimation of renal pelvic capacity before RPIS.[4] Conventional RGP is associated with radiation

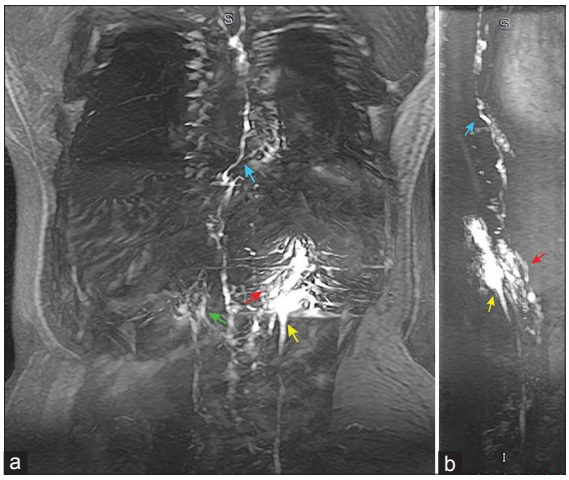

Figure 1: Coronal (a) and sagittal (b). Maximum intensity projection images of magnetic resonance imaging-Gadolinium retrograde pyelography of the left kidney with visualization of multiple transverse opacified lymphatic channels in the left perinephric region (red arrow) with few lymphatics refluxing across the midline to the contralateral right perinephric lymphatics (green arrow). These lymphatics are seen draining into the thoracic duct (blue arrow) right up to the thoracic inlet on the left side. Left renal pelvis and left ureter is also well-visualized (yellow arrow)

exposure that may not be desirable in certain specific situations like pregnancy. Contrast media used during RGP may be absorbed through the urothelium, leading to severe contrast media reactions including life-threatening anaphylactic reactions.[5] Although this has been reported very rarely, a theoretical risk for this always exists and use of contrast media is contraindicated in patients with known contrast allergy.

The use of Gd-RGP-MRI as explained in the current study avoids the use of ionic contrast media and radiation exposure as in conventional imaging. Another important advantage is simultaneous detailed intra-abdominal evaluation to diagnose the cause of chyluria especially in non-endemic countries. MRI has also been shown to be superior to lymphoscintigraphy for demonstration of chyle leakage where it was inconclusive.[2] The current approach appears to add the advantages of conventional RGP to the radiological information provided by MRI. However, all these potential advantages need to evaluate against the major disadvantages of MRI, most important being the high cost and limited availability. A larger study is needed to confirm the utility and place of this investigation in clinical practice.

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